AMENDMENTS TO THE CLAIMS

The following listing of claims replaces all prior versions, and listings, of claims in the captioned patent application:

Listing of Claims:

1 – 95. (Cancelled)

96. (Previously Presented) A system for rehabilitation of a recipient's hearing, comprising:

at least one acoustic sensor configured to convert a sensed acoustical signal into an electrical audio signal;

a fully implantable signal processing unit configured to process said audio signal, comprising:

an adaptive speech analysis and recognition module configured to detect and extract prosodic features from said audio signal, and

an adaptive speech synthesis module configured to convert said audio signal into an artificial speech signal based on said extracted prosodic features;

said speech analysis and recognition module and said speech synthesis module each being re-programmable while said signal processing unit is implantable; and

an actuator arrangement configured to provide output stimulation to one or more hearing structures of the recipient based on said artificial speech signal, comprising a flexible carrier member configured to be implanted in the cochlea of the recipient, and an array of actuators mounted in said flexible carrier member configured to stimulate the cochlea.

97. (Previously Presented) The system of claim 96, wherein said adaptive speech analysis and recognition module and said adaptive speech synthesis module are re-programmable via wireless telemetry means.

98. (Previously Presented) The system of claim 96, wherein said signal processing unit is further configured to transmit said audio signal to said actuator arrangement without converting said audio signal into said artificial speech signal, and wherein said actuator arrangement is configured to provide output stimulation based on said transmitted audio signal.

99. (Previously Presented) The system of claim 98, wherein said adaptive speech analysis and recognition module and said adaptive speech synthesis module are configured to be turned off to enable processing of said audio signal without converting said audio signal to said artificial speech signal.

100. (Previously Presented) The system of claim 99, further configured to automatically turn off said adaptive speech analysis and recognition module and said adaptive speech synthesis module to permit processing of said audio signal without converting said audio signal into said artificial speech signal.

101. (Previously Presented) The system of claim 99, further configured to turn off said adaptive speech analysis and recognition module and said adaptive speech synthesis module to permit processing of said audio signal without converting said audio signal into said artificial speech signal in response to a control signal from a remote control.

102. (Previously Presented) The system of claim 96, wherein said adaptive speech analysis and recognition module is configured to assign said audio signal to phonetic or lexical categories, and wherein said adaptive speech synthesis module is configured to convert said audio signal assigned to phonetic or lexical categories to said artificial speech signal.

103. (Previously Presented) The system of claim 96, wherein said adaptive speech analysis and recognition module comprises:

a digitally implemented neural network having automatic algorithms configured to detect and extract said prosodic features from said audio signal.

104. (Previously Presented) The system of claim 96, wherein said adaptive speech analysis and recognition module comprises:

a digitally implemented neural network having automatic algorithms configured to assign said audio signal to phonetic or lexical categories.

105. (Previously Presented) The system of claim 96, wherein said adaptive speech synthesis module comprises:

a digitally implemented neural network configured to convert said audio signal into said artificial speech signal based on said extracted prosodic features.

106. (Previously Presented) The system of claim 96, wherein said signal processing unit further comprises:

modules configured to perform tinnitus masking.

107. (Previously Presented) The system of claim 106, wherein said modules configured to perform tinnitus masking are configured to perform said tinnitus masking simultaneously with said conversion of said audio signal into said artificial speech signal.

108. (Previously Presented) The system of claim 96, wherein said adaptive speech analysis and recognition module is further configured to analyze said audio signal by performing speech segmentation or recognition.

109. (Previously Presented) The system of claim 96, wherein said signal processing unit further comprises:

adaptive signal processing algorithms configured to perform additional processing of said audio signal, and wherein said adaptive signal processing algorithms are reprogrammable after implantation of said signal processing unit.

110. (Previously Presented) The system of claim 96, wherein said system further comprises:
a rewritable implantable storage arrangement for accommodating and reproducing operating programs, wherein the contents of said storage arrangement may be changed or replaced via wireless telemetry means.

111. (Previously Presented) The system of claim 96, wherein said speech analysis and recognition module and said speech synthesis module comprise:
dynamic modules configured to optimize speech analysis and recognition and speech synthesis.

112. (Previously Presented) The system of claim 96, wherein said at least one acoustic sensor configured to convert a sensed acoustical signal into an electrical audio signal comprises:
at least one subcutaneously implantable acoustic sensor.

113. (Previously Presented) The system of claim 96, wherein said actuator arrangement comprises:
at least one extracochlear actuator configured to provide excitation to fluid-filled inner-ear spaces of the recipient.

114. (Previously Presented) The system of claim 113, wherein said extracochlear actuator comprises:
on or more of an acoustic stimulator or an electromechanical converter.

115. (Cancelled)

116. (Cancelled)

117. (Previously Presented) The system of claim 96, wherein said array of electromechanical converters further comprise:

mechanical actuation elements embedded in said carrier member between said converters configured to minimize mechanical wave propagation from a converter within said carrier member to adjacent converters.

118. (Currently Amended) The system of ~~claim 115~~ claim 96, wherein said array of actuators comprises:

an array of stimulating electrodes.

119. (Currently Amended) The system of ~~claim 115~~ claim 96, wherein said array of actuators comprises:

a combination of electromechanical converters and stimulating electrodes.

120. (Previously Presented) A system for rehabilitating a recipient's hearing, comprising:

at least one acoustic sensor configured to convert a sensed acoustical signal into an electrical audio signal;

a signal processing unit configured to process said audio signal, comprising:
a speech analysis and recognition module configured to detect and extract prosodic features from said audio signal, and

a speech synthesis module configured to convert said audio signal into an artificial speech signal based on said extracted prosodic features;

an actuator arrangement configured to provide output stimulation to one or more hearing structures of the recipient based on said artificial speech signal, comprising a flexible carrier member configured to be implanted in the cochlea of the recipient, and an array of actuators mounted in said flexible carrier member configured to stimulate the cochlea; and

wherein said signal processing unit is further configured to select processing of said audio signal without converting said audio signal into said artificial speech signal, and wherein said actuator arrangement is configured to provide output stimulation based on said processed audio signal.

121. (Previously Presented) The system of claim 120, wherein said speech analysis and recognition module and said speech synthesis module are configured to be turned off to enable processing of said audio signal without converting said audio signal to said artificial speech signal.

122. (Previously Presented) The system of claim 121, wherein said signal processing unit is configured to automatically turn off said speech analysis and recognition module and said speech synthesis module to permit processing of said audio signal without converting said audio signal into said artificial speech signal.

123. (Previously Presented) The system of claim 121, wherein said signal processing unit is configured to turn off said speech analysis and recognition module and said speech synthesis module to permit processing of said audio signal without converting said audio signal into said artificial speech signal in response to a control signal from a remote control.

124. (Previously Presented) The system of claim 120, wherein said speech analysis and recognition module and said speech synthesis module are re-programmable.

125. (Previously Presented) The system of claim 120, wherein said speech analysis and recognition module is configured to assign said audio signal to phonetic or lexical categories, and wherein said speech synthesis module is configured to convert said audio signal assigned to phonetic or lexical categories to said artificial speech signal.

126. (Previously Presented) The system of claim 120, wherein said speech analysis and recognition module comprises:

a digitally implemented neural network having automatic algorithms configured to detect and extract said prosodic features from said audio signal.

127. (Previously Presented) The system of claim 120, wherein said speech analysis and recognition module comprises:

a digitally implemented neural network configured to assign said audio signal to phonetic or lexical categories with automatic algorithms.

128. (Previously Presented) The system of claim 120, wherein said speech synthesis module comprises:

a digitally implemented neural network configured to convert said audio signal into said artificial speech signal based on said extracted prosodic features.

129. (Previously Presented) The system of claim 120, wherein said signal processing unit further comprises:

modules configured to perform tinnitus masking.

130. (Previously Presented) The system of claim 129, wherein said modules configured to perform tinnitus masking are configured to perform said tinnitus masking simultaneously with said conversion of said audio signal into said artificial speech signal.

131. (Previously Presented) The system of claim 120, wherein said speech analysis and recognition module is further configured to analyze said audio signal by performing speech segmentation or recognition.

132. (Previously Presented) The system of claim 120, wherein said signal processing unit further comprises:

adaptive signal processing algorithms configured to perform additional processing of said audio signal, and wherein said adaptive signal processing algorithms are reprogrammable after implantation of said signal processing unit.

133. (Previously Presented) The system of claim 120, wherein said system further comprises:

a rewritable implantable storage arrangement for accommodating and reproducing operating programs, wherein the contents of said storage arrangement may be changed or replaced via wireless telemetry means.

134. (Previously Presented) The system of claim 120, wherein said speech analysis and recognition module and said speech synthesis module comprise:

dynamic modules configured to optimize speech analysis and recognition and speech synthesis.

135. (Previously Presented) The system of claim 120, wherein said at least one acoustic sensor configured to convert a sensed acoustical signal into an electrical audio signal comprises:

at least one subcutaneously implantable acoustic sensor.

136. (Previously Presented) The system of claim 120, wherein said actuator arrangement comprises:

at least one extracochlear actuator configured to provide excitation to fluid-filled inner-ear spaces of the recipient.

137. (Previously Presented) The system of claim 136, wherein said extracochlear actuator comprises:

one or more of an acoustic stimulator or an electromechanical converter.

138. (Cancelled)

139. (Cancelled)

140. (Previously Presented) The system of claim 120, wherein said array of electromechanical converters further comprise:

mechanical actuation elements embedded in said carrier member between said converters configured to minimize mechanical wave propagation from a converter within said carrier member to adjacent converters.

141. (Previously Presented) The system of claim 138, wherein said array of actuators comprises:

an array of stimulating electrodes.

142. (Previously Presented) The system of claim 138, wherein said array of actuators comprises:

a combination of electromechanical converters and stimulating electrodes.

143. (Currently Amended) A method for processing a sound in a fully implantable cochlear implant, comprising:

converting a sensed acoustical signal into an electrical audio signal;

processing said audio signal comprising:

detecting an extracting prosodic features from said audio signal with a first dynamic module; and

converting said audio signal into an artificial speech signal based on said extracted prosodic features at a second dynamic module;

stimulating one or more hearing structures of a recipient based on said artificial speech signal with an actuator arrangement comprising a flexible carrier member configured to be implanted in the cochlea of the recipient, and an array of actuators mounted in said flexible carrier member configured to stimulate the cochlea; and

allowing said first and second dynamic modules to optimize said processing.

144. (Previously Presented) The method of claim 143, further comprising:

reprogramming said first and second modules via wireless telemetry means.

145. (Previously Presented) The method of claim 143, further comprising:

processing said audio signal without converting said audio signal into said artificial speech signal, and

stimulating the one or more hearing structures of the recipient based on said non-converted audio signal.

146. (Previously Presented) The method of claim 145, further comprising:

turning off said first and second dynamic modules to enable processing of said audio signal without converting said audio signal to said artificial speech signal.

147. (Previously Presented) The method of claim 145, further comprising:

allowing said first and second dynamic modules to automatically turn off to permit processing of said audio signal without converting said audio signal into said artificial speech signal.

148. (Previously Presented) The system of claim 143, further comprising:

performing additional processing of said audio signal with adaptive signal processing algorithms.